

WHAT IS CLAIMED IS

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1. A magnetic head, comprising:
a magneto-resistive film having a
ferromagnetic free layer at a top part thereof, said
ferromagnetic free layer changing a magnetization
10 thereof in response to an external magnetic field;
first and second magnetic domain control
patterns provided on said ferromagnetic free layer,
each of said first and second magnetic domain control
patterns causing a pinning of magnetization in said
15 ferromagnetic free layer in the vicinity thereof;
a first electrode provided on said
ferromagnetic free layer in contact therewith at a
region located between said first and second magnetic
domain control patterns; and
20 a second electrode provided in electrical
contact with a bottom surface of said magneto-
resistive film.

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2. A magnetic head as claimed in claim 1,
further comprising a first insulating film covering
said first magnetic domain control pattern and a
30 second insulating film covering said second magnetic
domain control pattern, such that said first
insulating film is interposed between said first
magnetic domain control pattern and said first
electrode and such that said second insulating film is
35 interposed between said second magnetic domain control
pattern and said first electrode.

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3. A magnetic head as claimed in claim 2,
wherein said first and second insulating films have a
generally identical thickness.

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4. A magnetic head, comprising:
a magneto-resistive film;

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a pair of magnetic domain control patterns
provided at both lateral sides of said magneto-
resistive film, each of said magnetic domain control
patterns causing a pinning of magnetization in said
magneto-resistive film in the vicinity thereof;

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a pair of electrodes provided respectively
on said pair of magnetic domain control regions with a
mutual separation from each other, each electrode
having a tip-end part extending over said magneto-
resistive film toward the other electrode,

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wherein each tip-end part extends beyond
said domain control region, on which said electrode
having said tip-end part is provided, with a
protruding distance of 0.25 μ m or less.

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5. A magnetic disk apparatus, comprising:
a rotary magnetic disk; and

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a magnetic head scanning over a surface of
said magnetic disk,

said magnetic head comprising:

a magneto-resistive film having a

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ferromagnetic free layer at a top part thereof, said
ferromagnetic free layer changing a magnetization
thereof in response to an external magnetic field;
first and second magnetic domain control

patterns provided on said ferromagnetic free layer, each of said first and second magnetic domain control patterns causing a pinning of magnetization in said ferromagnetic free layer in the vicinity thereof;

5 a first electrode provided on said ferromagnetic free layer in contact therewith at a region located between said first and second magnetic domain control patterns; and

10 a second electrode provided in electrical contact with a bottom surface of said magneto-resistive film.

15 6. A magnetic disk apparatus, comprising:
a rotary magnetic disk; and
a magnetic head scanning over a surface of
said magnetic disk,

20 said magnetic head comprising:
a magneto-resistive film;
a pair of magnetic domain control patterns provided at both lateral sides of said magneto-resistive film, each of said magnetic domain control
25 patterns causing a pinning of magnetization in said magneto-resistive film in the vicinity thereof;

 a pair of electrodes provided respectively on said pair of magnetic domain control regions with a mutual separation from each other, each electrode
30 having a tip-end part extending over said magneto-resistive film toward the other electrode,

 wherein each tip-end part extends beyond said domain control region, on which said electrode having said tip-end part is provided, with a
35 protruding distance of 0.25 μ m or less.

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5 resistive film;

patterning said resist film to form a resist pattern;

10 causing a shrinkage in said resist pattern;
and

conducting a second process while using the
shrunk resist pattern as a mask.

20 forming a magneto-resistive film on a
substrate such that said magneto-resistive film
includes a ferromagnetic layer on a top part thereof;

patterning said resist film to form a resist pattern;

35 causing a shrinkage in said resist pattern
to form a shrunken resist pattern;

depositing an insulating film on said

[illegible]

5 together with a part of said insulating film covering
said shrunken resist pattern so as to expose a part of
said magneto-resistive film on which said shrunken
resist pattern has been provided; and

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forming a resist film on said magneto-
resistive film;

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depositing a magnetic film having a coercive force larger than a coercive force of said magneto-resistive film while using said resist pattern as a mask, such that a pair of high-coercive magnetic regions having a large coercive force are formed at both lateral sides of said magneto-resistive pattern from said ferromagnetic film;

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causing a shrinkage in said resist pattern;
depositing a conductive layer on said
magneto-resistive film while using said shrunken

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